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question." Without detracting from the ultimate desirability of some such scheme as that proposed by Professor Riesman, may it not be more easy and advisable for us at once to adopt the principle of planning for the effective use of the summer vacation by all students in our technical schools, and of making three such periods a prerequisite for graduation? Our students will not be deprived of any more life, liberty and the pursuit of happiness than they will have to relinquish when they do graduate if we give them two vacation periods of approximately two weeks each, one immediately following the end of the school year, the other immediately preceding the next.

The chief objection to this scheme will come from those who want the summer for play—a class for whom we are not planning our college work—and those teachers who will claim that it is impossible to place the men. "Why?" "Oh, because industry doesn't want them." "Well then, train men who will be in demand; our best equipped institutions meet with little difficulty."

The scheme outlined has the merit of being the ideal toward which many of our institutions are even now striving, but complete success demands the wholeheartedness of combined effort and determination.

LANCASTER D. BURLING

GEOLOGICAL SURVEY OF CANADA

GERMAN GEOLOGISTS AND THE WAR

TO THE EDITOR OF SCIENCE: Some idea of the terrible way in which the war is depleting the ranks of German men of science can be gained from a study of the lists of German and Austrian geographers and geologists enrolled in military organizations which have been published in the "Geologische Rundschau." These lists, which can be found in the numbers published on December 8, 1914, February 26, 1914 and December 14, 1915, combined with a short list in the November, 1915, number of *Der Geologe*, contain a total of 237 names. Of this total, 54 are reported killed and two missing and probably dead, a mortality of almost twenty-five per cent.

The number of the *Geologische Rundschau*

just received (published on December 14, 1915), contains portraits and obituaries of three young German geologists who are well known to many of the profession in this country through their participation in the excursions and meetings of the Twelfth International Geological Congress held in Canada in the summer of 1913. They are Curt Alfons Haniel, privatdozent in geology and paleontology in the University of Bonn, killed in action near Laon on December 29, 1914; Siegfried Martius, assistant in the Mineralogical-Petrographical Institute at Bonn, fatally wounded at Ypres on October 23, 1914; and Adolf A. Riedel, a student just completing the work for his doctorate at Munich, a man of unusually attractive personality and of great intellectual promise, who was killed in northern France on November 21, 1914. Another participant in the International Congress, Dr. Wilhelm Paulcke, of Karlsruhe, has been reported wounded and the recipient of the Iron Cross.

A further indication of the serious character of the German losses is given by the statement of the last number of *Der Geologe* (November, 1915) that 75 of the personnel of the Royal Prussian Department of Mines had lost their lives up to April 1, 1915. This periodical also reports that Dr. Quitzow, editor of *Der Geologe* and *Der Geologen-Kalender* had not been heard from for a year, after being in action on the eastern front.

WALTER L. BARROWS

TRINITY COLLEGE,
March 14, 1916

SCIENTIFIC BOOKS

The Feebly Inhibited: Nomadism, or the Wandering Impulse, with Special Reference to Heredity: Inheritance of Temperament.
BY CHARLES B. DAVENPORT.

The author argues that "all cases of nomadism can be ascribed to one fundamental cause—that those who show the trait belong to the nomadic race" made up of those possessed of the nomadic impulse. This impulse "depends upon the absence of a simple sex-linked gene that 'determines' domesticity." The data for the argument are family-histor-

ies, reported in the main by field-workers. Each individual is rated (by the author apparently) as nomadic or non-nomadic. From this point on, the argument concerns the explanation of apparent exceptions to expectation by the hypothesis, and of numerical divergences from the ratios expected by the hypothesis.

It seems to the reviewer that the technique of this and similar studies might easily be very much improved by having the individuals who are to be classified (for nomadism or neuroticism or intelligence, or whatever the quality may be), rated quantitatively and independently by, say, half a dozen competent persons. Where, as here, records of persons, not the persons themselves, are to be rated, this means of reducing errors in the rating is very easy to apply. Its importance consists in the fact that at least ninety-five per cent. of the mental traits which have been measured objectively show no signs of a multi-modal distribution; and that consequently the *a priori* chances are at least 19 to 1 that the strength of the nomadic impulse varies from a single mode at moderate amount up toward extreme nomadism and down toward extreme domesticity. To begin work by classifying men on the supposition that the strength of the nomadic impulse is distributed with one mode of nomads and one mode of home lovers seems therefore peculiarly unwise. If we can not have objective measurements we can at least use the average of a number of subjective ratings and have these made by a scale detailed enough to measure the nomadic impulse as probably stronger in a man who "is a wanderer and has left home repeatedly and been away for months at a time . . . does not like to stay in one place long; likes to bum and tramp around" than in one of whom nothing more nomadic is recorded than that he was "a stage-driver."

With respect to the inheritance of temperament, the hypothesis defended is that "There is in the germplasm a factor, E, which induces the more or less periodic occurrence of an excited condition (or an exceptionally strong reactivity to exciting presentations) and its

absence, e, which results in an absence of extreme excitability. There are also the factor C, which makes for normal cheerfulness of mood, and its absence, c, which permits a more or less periodic depression. Moreover, these factors behave as though in different chromosomes, so that they are inherited independently of each other and may occur in any combination."

The author classifies individuals by their zygotic formulæ as choleric-cheerful, choleric-phlegmatic, choleric-melancholic, nervous-cheerful, nervous-phlegmatic, nervous-melancholic, calm-cheerful, calm-phlegmatic, calm-melancholic.

He assumes further that "there is typically a difference in the mood of a person with two doses or only one dose of a determiner; that two doses of the E factor produce the choleric temperament, while only one dose results in the nervous temperament; that two doses of the C factor result in a normal, cheerful state, while if only one dose is present the individual has a tendency to appear phlegmatic, and if C is wholly absent, to appear melancholic."

The argument concerns, of course, the closeness of the fit of the ratios found to those expected and the explanation of the apparently unconformable cases.

The difficulty of classification may be appreciated by the reader who will try to assign each of these cases to some one of the nine classes, have scientific friends do likewise and compare the results with Davenport's assignments.

1. Subject to sprees; suicided with poison.
2. Had acute mania; violent and destructive.
3. Sx.;¹ restless and twitches.
4. Surly and disagreeable; was hypererotic and brutal to wife and children.
5. Has a swaggering air and manner; ran away from home; put in a reform school for rape.
6. Wild and hot-tempered; profane and ugly towards his wife; takes whisky regularly to forget his business worries.
7. Jailed at 14 years for rape; hung himself.
8. Rough and uncouth; easily excited, passionate; has fits of temper.

¹ Sx. means unduly sexual.

9. Was Sx.; attempted to hang herself; flew into fits of temper; was slovenly, seclusive, indecent; at 32 had delusions of being poisoned; threw herself out of window.

10. Cut his throat with a razor.

11. Cut his throat as his father did.

12. Garrulous; jumps from one topic to another; has sudden emotional changes; said to have attempted suicide.

13. Had a nervous breakdown twice; is very hot-tempered; jumps from one topic to another.

14. An actress who is obstinate, irritable and passionate; after childbirth she became deranged and is now obstinate, silly and shameless; has attempted suicide.

15. A great talker; at 31 became violent, restless, noisy; developed delusions and hallucinations and threatened to commit suicide.

16. Contrary and stubborn; hyper-religious; became noisy, restless, sullen, had delusions.

17. Impulsive, irritable and passionate; became excited; attempted to shoot himself.

18. Quick-tempered; at 32 became excited; had acute mania.

19. Alcoholic, cross, irritable; at 37 threatened suicide; was excitable; had delusions and hallucinations.

20. Quick-tempered, had delirium tremens and hallucinations.

21. Sulky and impatient as a boy; drank; quick-tempered, homicidal and suicidal; has hallucinations and delusions.

22. High-tempered, extravagant; became insane and jumped out of window, killing herself.

23. At 20 became erratic, silly, irresponsible; wanted to travel and follow girls.

24. Obstinate, irritable and passionate as a child; became hysterical and tried to hang herself and kill her child.

These are a random half of his cases of the choleric-cheerful.

Is it not wise to delay acceptance of any simple Mendelian hypotheses for the inheritance of the strength of the tendencies to wander, to be excited, calm, elated and depressed, until the pedigree individuals are measured, or at least classified, by some criteria that are objectively definable? The reviewer welcomes the studies of the Eugenics Laboratory and appreciates the devotion that inspires them and the labor which sustains

them. But he is left unconverted by each one—indeed, more confirmed in the faith, or fear, that human mental traits are due to a number of determiners or a variation in strength of the same determiner.

EDWARD L. THORNDIKE

TEACHERS COLLEGE,
COLUMBIA UNIVERSITY

A Comparison of Methods for Determining the Respiratory Exchange of Man. By THORNE M. CARPENTER. 265 pp.

Energy Transformations during Horizontal Walking. By FRANCIS G. BENEDICT and HANS MURSCHEHAUSER. 100 pp.

Physiology of the New-Born Infant. Character and Amount of the Katabolism. By FRANCIS G. BENEDICT and FRITZ B. TALBOT. 126 pp. Publications Nos. 216, 231, 233. Carnegie Institution of Washington, Nutrition Laboratory.

The study of the respiratory exchange of man has long been, and will doubtless long continue to be, one of the most fruitful fields of physiological investigation. Its value rests chiefly upon this fact of supreme importance: namely, that alike during rest and exercise, in health and disease, the method of indirect calorimetry as calculated from the respiratory exchange affords measurements of the energy expenditures of the body which are in close agreement with direct calorimetric determinations. Not only are the technical procedures of the indirect method far simpler and more generally applicable than are those of the direct method, but the former also afford a deeper insight into the sources of the energy than do the latter. Thus from a measurement of the volume of the air expired in a given time, and an analysis of its content of oxygen and carbon dioxide, we can determine accurately the amount and the character of the food stuffs consumed in the body. From such data are to be deduced the dietetic needs of the clerk and the stevedore, the bread cards of a blockaded people, the ration of the marching soldier, the food needed by the new-born infant, and the requirements of the typhoid patient. With such data we may meet more